CENTERS FOR DISEASE CONTROL

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585 Hospital Discharge Rates for Four Major Cancers — United States, 1970–1986

593 Increase in Pneumonia Mortality Among Young Adults and the HIV Epidemic — New York City, United States

Current Trends

Hospital Discharge Rates for Four Major Cancers — United States, 1970–1986

Cancers of the breast, cervix, colon/rectum, and lung are among the cancers that contribute the most morbidity and mortality in the United States or that are the most preventable. This report describes national trends in hospital discharge rates from 1970 to 1986 for these four cancers.

Using the first-listed diagnosis in the National Hospital Discharge Survey (NHDS) (*1*) of the National Center for Health Statistics (NCHS), the annual number of hospital discharges for each of these cancers was determined.* NHDS data were obtained from a complex probability sample of nonfederal short-stay hospitals in the 50 states and the District of Columbia. Population estimates were determined from data provided by the Bureau of the Census (*4*) and Demo-Detail† (*5*).

During the 1980s, the number of hospital discharges per 100,000 population has declined for each cancer (Figure 1). Breast, lung, and colorectal cancer consistently increased from 1970 to the early 1980s and declined thereafter. The rate of hospital discharges for cervical cancer fluctuated without an overall trend from 1970 to 1978, then declined slightly. These trends are consistent with a decline in the overall hospital discharge rate that began in 1983 (*6*).

Among these four cancers, breast cancer in women had the highest hospital discharge rate over the entire period, and lung cancer in men had the second highest. In 1970, rates for cervical, colorectal§, and lung cancer in women ranked third, fourth, and fifth, respectively. By 1986, cervical cancer had the lowest rate, while lung cancer rates for women approached those for colorectal cancer.

Hospital discharge rates for lung cancer in both men and women increased approximately the same amount from 1970 through 1986. Rates for men increased 60% from 88.6 to 142.2, a difference of 53.6 discharges per 100,000 persons. Rates for

*Diagnoses for 1970–1978 are based on the *International Classification of Diseases* (ICD), *Eighth Revision, Adapted* (*2*); those for 1979–1986, on the ICD, *Ninth Revision, Clinical Modification* (ICD-9-CM) (*3*).

†Use of trade names is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

§Hospital discharge rates for colorectal cancer include both men and women since rates by sex are similar.

Cancer — Continued

women increased 304% from 20.4 to 83.3, a difference of 62.9 discharges per 100,000. The rate ratio of men to women decreased from 4.3 to 1.7; the rate difference decreased from 68.2 to 58.9.

Hospital discharge rates for lung cancer increased sharply with the change from the ICD-8 to ICD-9-CM (*2,3*). The increase in the hospital discharge rate for lung cancer from 1978 to 1979 is 57% of the net increase from 1970 through 1986 for men and 42% for women. Nevertheless, even if all the 1978–79 increase is attributed to ICD coding changes, the data indicate a substantial increase in hospitalization rates for lung cancer.

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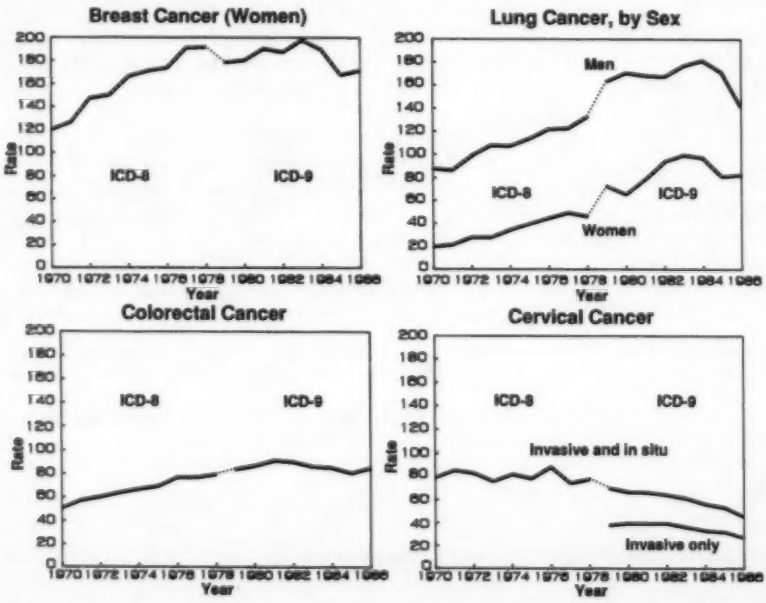
Editorial Note: Although chronic diseases are recognized as major causes of morbidity and mortality in the United States, assessing their public health impact is difficult. Increasingly, investigators have suggested the use of hospital discharge data to evaluate the impact of these diseases. State health departments can use hospital discharge data, along with vital statistics, special surveys, and registries, to indicate disease burden. Comparing state and local patterns of chronic disease impact with national patterns can help guide allocation of resources for chronic disease prevention and control programs.

Hospital discharge rates reflect various forces, including health-care policies, access to care, diagnostic and treatment modalities, quality of reporting, case-fatality

FIGURE 1. Hospital discharge rates per 100,000 persons for selected cancers — United States, 1970–1986



Cancer — Continued

rates, and patient survival. Introduction of diagnostic-related group (DRG) standards, for example, may have influenced hospitalization rates after 1983 (*7,8*). Continued improvements in the treatment and diagnosis of cancers and their precursor conditions, as well as shifts from in-hospital to outpatient performance of such procedures, also may have been important in determining these rates. Likewise, increases in patient survival for all four of these cancers during recent decades undoubtedly have influenced the rates (*9*).

NHDS hospital discharge rates also reflect both initial admissions and readmissions. At the same time, hospitalization for cancer diagnosis and treatment is characterized by multiple admissions (*10*). Because NHDS data do not distinguish between initial admissions and readmissions, observed hospital discharge rates for all four cancers are approximately one and one half to eight times those of incidence rates obtained from the Surveillance, Epidemiology and End Results (SEER) program (*9,11*).

Finally, changes in hospital discharge rates may not reflect the magnitude and direction of changes in cancer incidence rates. Trends in hospital discharge rates from 1973 through 1985 for cervical, colorectal, and lung cancers in men are similar to SEER incidence rates for the same period. By contrast, SEER lung cancer incidence rates in women increase more rapidly than do hospital discharge rates. For breast cancer, both incidence and hospital discharge rates increase during the period, although the patterns of increase for the two data sources are different and only hospital discharge rates decrease after 1982.

Nevertheless, as one measure of disease burden, NCHS hospital discharge rates can be valuable to the surveillance of trends in the public health impact of cancer. The data allow for the examination of temporal, geographic, and subgroup patterns over a 17-year period for a probability sample of hospital discharges for the entire United States from 1970 through 1986. In addition, these data are relatively simple to use, acceptable to the medical community, and readily available. Other attributes of public health surveillance, such as representativeness of health trends in the general population, validity, and reliability, will be evaluated as the usefulness of these data for chronic disease surveillance continues to be assessed (*12*).

While NHDS can describe national trends in hospitalization for chronic diseases, it cannot measure chronic disease hospitalization trends for specific states. CDC is working with three states to evaluate state-based data sources and to develop standard methods for analyzing and reporting chronic disease surveillance information. Cooperation with state and local health facilities will be important for investigating the complex relationship between cancer prevalence, incidence, and public health burden on the one hand and public health policy, treatment, and economic forces on the other.

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Cancer – Continued

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TABLE I. Summary – cases of specified notifiable diseases, United States

Disease	38th Week Ending			Cumulative, 38th Week Ending		
	Sept. 24, 1988	Sept. 26, 1987	Median 1983-1987	Sept. 24, 1988	Sept. 26, 1987	Median 1983-1987
Acquired Immunodeficiency Syndrome (AIDS)	1,029	U*	150	22,997	13,776	5,568
Aseptic meningitis	200	375	401	4,237	8,149	7,020
Encephalitis: Primary (arthropod-borne & unspec)	15	37	45	564	941	860
Post-infectious	4	-	2	97	84	88
Gonorrhea: Civilian	13,975	14,089	20,346	497,832	565,887	638,320
Military	231	235	444	8,717	12,104	15,566
Hepatitis: Type A	585	447	482	17,981	17,917	15,959
Type B	398	473	524	16,438	18,679	18,595
Non A, Non B	33	39	67	1,878	2,242	2,620
Unspecified	47	51	112	1,529	2,300	3,571
Legionellosis	19	23	17	677	697	528
Leprosy	-	1	7	115	146	187
Malaria	38	20	31	692	679	701
Measles: Total†	42	26	12	2,271	3,337	2,471
Indigenous	42	25	10	2,041	2,934	2,054
Imported	-	1	2	230	403	282
Meningococcal infections	17	35	30	2,157	2,196	2,075
Mumps	48	145	44	3,527	10,462	2,483
Pertussis	83	70	109	1,856	1,838	1,838
Rubella (German measles)	7	2	8	166	304	555
Syphilis (Primary & Secondary): Civilian	826	726	643	29,242	25,557	20,262
Military	5	-	3	120	127	127
Toxic Shock syndrome	6	13	6	241	249	283
Tuberculosis	514	499	491	15,334	15,496	15,496
Tularemia	2	9	7	148	157	157
Typhoid Fever	15	12	9	255	247	247
Typhus fever, tick-borne (RMSF)	20	14	30	534	519	595
Rabies, animal	62	117	112	3,097	3,583	3,961

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1988		Cum. 1988
Anthrax	-	Leptospirosis (Hawaii 1)	25
Botulism: Foodborne	17	Plague	14
Infant (Kans. 1)	27	Poliomyelitis, Paralytic	-
Other	3	Psittacosis (Upstate N.Y. 1, Tex. 1)	66
Brucellosis	44	Rabies, human	-
Cholera (Kans. 1)	3	Tetanus (Va. 1)	36
Congenital rubella syndrome	3	Trichinosis	36
Congenital syphilis, ages < 1 year	302		
Diphtheria	-		

*There were no cases of internationally imported measles reported for this week.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending September 24, 1988 and September 26, 1987 (38th Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1987	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988
UNITED STATES	22,997	4,237	564	97	497,832	565,887	17,981	16,438	1,878	1,529	677	115
NEW ENGLAND	975	264	19	6	15,686	17,357	644	908	102	69	32	15
Maine	26	14	1	-	309	521	17	45	4	1	3	-
N.H.	28	34	1	3	198	291	37	55	7	4	4	-
Vt.	9	16	6	-	93	156	13	30	5	4	1	-
Mass.	533	105	8	3	5,383	6,228	300	556	69	45	21	14
R.I.	60	56	-	-	1,374	1,533	73	67	10	-	3	1
Conn.	319	39	3	-	8,309	8,628	204	155	7	15	-	-
MID. ATLANTIC	7,711	404	47	4	78,845	88,312	1,185	2,250	131	173	173	8
Upstate N.Y.	1,016	258	28	1	10,903	12,524	548	589	50	17	70	-
N.Y. City	4,240	85	8	3	33,751	45,379	244	924	12	124	32	7
N.J.	1,835	61	11	-	11,309	11,826	214	530	47	28	40	1
Pa.	620	-	-	-	22,882	18,583	181	227	22	3	31	-
E.N. CENTRAL	1,607	696	143	12	82,197	85,824	1,189	1,729	166	87	135	4
Ohio	361	234	47	3	18,629	18,871	264	402	27	16	53	-
Ind.	80	66	17	-	6,386	6,594	109	252	17	20	15	-
Ill.	754	79	32	9	24,221	26,024	340	365	58	19	-	3
Mich.	334	273	34	-	26,841	26,546	288	511	42	29	48	-
Wis.	78	34	13	-	6,120	7,589	188	199	22	3	19	1
W.N. CENTRAL	542	183	40	8	21,023	23,097	1,054	760	84	26	61	1
Minn.	123	29	11	3	2,871	3,508	79	98	16	3	2	-
Iowa	28	27	8	1	1,596	2,182	37	72	13	1	16	-
Mo.	276	68	1	-	11,856	12,202	822	441	36	14	14	-
N. Dak.	4	-	4	-	118	216	5	8	3	4	1	-
S. Dak.	5	16	1	1	374	441	8	4	2	-	14	-
Nebr.	31	9	9	2	1,184	1,491	44	40	2	-	5	-
Kans.	75	34	6	1	3,024	3,057	259	99	12	4	9	1
S. ATLANTIC	3,931	928	84	34	141,998	147,887	1,651	3,538	286	248	113	1
Del.	53	30	3	-	2,158	2,496	28	111	7	2	10	-
Md.	411	129	7	3	14,789	16,933	219	503	31	21	17	1
D.C.	365	17	1	1	10,141	9,807	12	33	3	1	1	-
Va.	285	107	26	4	10,319	11,113	292	239	57	160	9	-
W. Va.	15	26	18	-	984	1,068	12	52	3	3	-	-
N.C.	212	107	18	-	19,958	21,332	237	611	70	-	29	-
S.C.	133	17	-	1	11,084	11,656	33	387	10	5	17	-
Ga.	504	104	1	-	27,301	26,468	379	483	12	6	15	-
Fla.	1,953	391	10	25	45,264	46,815	439	1,119	93	48	15	-
E.S. CENTRAL	578	276	50	8	39,391	42,902	617	1,044	140	8	37	1
Ky.	70	93	16	1	3,987	4,320	434	224	54	2	16	-
Tenn.	268	24	13	-	13,118	14,936	116	492	35	-	8	-
Ala.	149	132	21	2	12,333	13,791	41	247	42	6	10	1
Miss.	91	27	-	5	9,953	9,855	26	81	9	-	3	-
W.S. CENTRAL	2,115	528	64	3	54,409	64,613	2,082	1,391	159	379	16	19
Ark.	71	9	4	-	5,469	7,382	254	79	4	13	3	-
La.	270	83	19	1	10,911	11,310	107	256	20	11	5	1
Okla.	99	49	4	-	5,176	7,054	386	135	34	22	8	-
Tex.	1,675	387	37	2	32,853	38,867	1,335	921	101	333	-	18
MOUNTAIN	657	150	22	2	10,822	14,945	2,482	1,228	201	123	34	1
Mont.	11	2	-	-	330	422	28	42	10	4	1	-
Idaho	9	1	-	-	274	543	112	84	5	3	-	-
Wyo.	5	2	-	-	155	328	5	12	3	-	3	-
Colo.	230	59	3	-	2,362	3,321	168	150	69	57	8	1
N. Mex.	36	13	2	-	1,066	1,656	440	183	16	2	2	-
Ariz.	221	42	8	1	3,888	5,096	1,304	480	59	37	13	-
Utah	50	20	4	1	408	462	248	103	34	16	3	-
Nev.	95	11	5	-	2,339	3,117	177	174	15	4	4	-
PACIFIC	4,881	818	95	20	53,481	81,150	7,077	3,590	609	418	76	65
Wash.	283	-	6	4	5,046	6,382	1,587	618	149	46	15	4
Oreg.	141	-	-	-	2,342	3,004	1,018	439	63	21	-	1
Calif.	4,368	724	84	16	44,867	69,895	4,096	2,443	388	339	58	52
Alaska	16	16	3	-	748	1,249	367	46	5	7	-	1
Hawaii	73	78	2	-	478	620	9	39	4	5	3	7
Guam	1	-	-	-	97	154	9	11	-	2	1	4
P.R.	845	48	3	1	962	1,498	32	195	36	34	-	3
V.I.	32	-	-	-	297	200	1	5	2	-	-	-
Amer. Samoa	-	-	-	-	65	64	3	2	-	5	-	2
C.N.M.I.	-	-	-	-	34	-	1	2	-	4	-	1

N: Not notifiable U: Unavailable C.N.M.I.: Commonwealth of the Northern Mariana Islands

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending September 24, 1988 and September 26, 1987 (38th Week)

Reporting Area	Malaria	Measles (Rubeola)					Meningococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1988	1988	Cum. 1988	1988	Cum. 1988	Cum. 1987	Cum. 1988	1988	Cum. 1988	1988	Cum. 1988	Cum. 1987	1988	Cum. 1988	Cum. 1987
UNITED STATES	692	42	2,041	-	230	3,337	2,157	48	3,527	83	1,856	1,838	7	166	304
NEW ENGLAND	53	-	81	-	50	289	188	3	109	4	129	116	2	8	1
Maine	2	-	7	-	-	3	8	-	-	-	11	26	-	-	1
N.H.	2	-	66	-	44	182	22	2	96	-	34	27	-	3	-
Vt.	5	-	-	-	-	26	13	-	4	-	3	4	-	-	-
Mass.	27	-	1	-	2	54	84	1	7	3	53	42	2	4	-
R.I.	6	-	-	-	-	2	21	-	-	-	10	1	-	1	-
Conn.	11	-	7	-	4	22	38	-	-	1	18	16	-	-	-
MID. ATLANTIC	110	2	803	-	47	577	221	4	292	12	121	215	-	12	11
Upstate N.Y.	30	-	19	-	18	40	102	1	63	5	73	122	-	2	9
N.Y. City	57	2	43	-	5	460	54	-	94	-	4	8	-	7	1
N.J.	11	-	217	-	11	39	63	-	35	-	4	12	-	1	1
Pa.	12	-	524	-	13	38	2	3	80	7	40	73	-	2	-
E.N. CENTRAL	34	-	132	-	48	322	295	12	714	16	197	218	-	26	37
Ohio	8	-	2	-	23	5	103	11	108	15	40	55	-	1	-
Ind.	2	-	57	-	-	-	24	1	70	-	61	15	-	-	-
Ill.	2	-	55	-	16	142	66	-	265	-	29	15	-	21	26
Mich.	19	-	18	-	5	25	64	-	177	1	33	42	-	4	9
Wis.	3	-	-	-	4	146	38	-	94	-	34	89	-	-	2
W.N. CENTRAL	17	-	11	-	2	230	79	2	121	1	109	110	-	2	1
Minn.	5	-	10	-	1	39	17	-	-	-	49	13	-	-	-
Iowa	2	-	-	-	-	-	-	-	32	-	21	41	-	-	1
Mo.	6	-	1	-	1	189	27	-	30	1	17	28	-	-	-
N. Dak.	-	-	-	-	-	1	-	-	-	-	11	11	-	-	-
S. Dak.	-	-	-	-	-	-	3	-	1	-	6	3	-	-	-
Nebr.	1	-	-	-	-	-	12	-	11	-	-	1	-	-	-
Kans.	3	-	-	-	-	1	20	2	47	-	6	13	-	2	-
S. ATLANTIC	87	23	329	-	16	140	376	16	566	1	200	259	-	17	14
Del.	1	-	-	-	-	32	2	-	-	-	7	5	-	-	2
Md.	10	-	11	-	3	7	43	2	105	-	32	11	-	1	2
D.C.	11	-	-	-	-	1	7	11	227	-	1	-	-	-	-
Va.	14	23	164	-	2	1	42	-	119	-	21	47	-	11	1
W. Va.	-	-	6	-	-	-	7	-	13	-	8	35	-	-	-
N.C.	13	-	-	-	4	5	61	-	43	1	58	107	-	-	1
S.C.	9	-	-	-	-	2	33	-	5	-	1	-	-	-	-
Ga.	5	-	-	-	-	1	57	-	27	-	31	23	-	2	1
Fla.	24	-	148	-	7	91	124	3	27	-	41	31	-	3	7
E.S. CENTRAL	13	-	56	-	-	6	210	-	423	7	82	33	-	2	3
Ky.	-	-	35	-	-	-	49	-	208	-	12	1	-	-	2
Tenn.	-	-	1	-	-	-	117	-	200	5	25	9	-	2	1
Ala.	8	-	1	-	-	4	31	-	12	2	42	18	-	-	-
Miss.	5	-	19	-	-	2	13	N	N	-	3	5	-	-	-
W.S. CENTRAL	64	3	14	-	3	409	140	5	685	8	104	231	3	10	11
Ark.	3	-	-	-	1	-	17	1	99	8	19	12	-	3	2
La.	10	-	-	-	-	-	42	1	296	-	16	42	-	-	-
Okla.	9	-	8	-	-	3	14	-	173	-	42	126	-	1	5
Tex.	42	3	6	-	2	406	67	3	147	-	27	51	3	6	4
MOUNTAIN	34	-	117	-	21	485	60	2	166	26	568	162	-	6	24
Mont.	5	-	5	-	19	128	2	-	2	-	2	6	-	-	8
Idaho	2	-	-	-	1	-	7	-	3	4	291	47	-	-	1
Wyo.	-	-	-	-	-	2	-	-	3	-	1	5	-	-	1
Colo.	11	-	112	-	1	9	15	-	28	5	20	65	-	2	-
N. Mex.	2	-	-	-	-	317	11	N	N	-	45	11	-	-	-
Ariz.	9	-	-	-	-	35	15	1	109	12	183	30	-	-	4
Utah	4	-	-	-	-	1	9	-	7	5	25	8	-	3	10
Nev.	1	-	-	-	-	3	1	1	14	-	1	-	-	1	-
PACIFIC	290	14	498	-	43	889	580	4	451	9	346	496	2	83	202
Wash.	16	-	2	-	-	41	53	-	42	2	84	70	-	-	2
Oreg.	12	-	4	-	-	80	33	N	N	2	29	59	-	-	2
Calif.	240	14	489	-	35	764	483	4	376	4	182	176	1	58	127
Alaska	3	-	-	-	-	-	6	-	9	-	6	6	-	-	2
Hawaii	9	-	3	-	8	4	15	-	13	-	45	185	1	25	69
Guam	-	-	-	-	1	2	-	-	2	-	-	-	-	1	1
P.R.	2	-	190	-	-	737	9	-	9	1	14	16	-	2	2
V.I.	-	-	-	-	-	-	-	-	29	-	-	-	-	-	-
Amer. Samoa	-	-	-	-	-	-	2	-	3	-	-	-	-	-	-
C.N.M.I.	1	-	-	-	-	-	1	-	2	-	-	-	-	-	-

*For measles only, imported cases includes both out-of-state and international importations.
N: Not notifiable U: Unavailable †International §Out-of-state

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending September 24, 1988 and September 26, 1987 (38th Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1988	Cum. 1987	Cum. 1988	Cum. 1988	Cum. 1987	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988
UNITED STATES	29,242	25,557	241	15,334	15,496	148	255	534	3,097
NEW ENGLAND	819	448	20	382	496	4	22	11	13
Maine	12	1	4	18	22	-	-	-	1
N.H.	6	3	4	8	16	-	-	-	5
Vt.	3	2	2	4	10	-	1	-	-
Mass.	313	206	8	216	273	3	13	6	-
R.I.	26	8	-	32	42	-	1	2	-
Conn.	459	228	2	104	123	1	7	3	7
MID. ATLANTIC	7,291	4,775	35	2,961	2,680	-	51	18	342
Upstate N.Y.	373	178	18	390	370	-	10	10	31
N.Y. City	5,307	3,500	6	1,623	1,267	-	30	6	-
N.J.	652	502	3	478	511	-	11	-	13
Pa.	959	595	8	470	532	-	-	2	298
E.N. CENTRAL	789	674	35	1,696	1,764	1	23	50	112
Ohio	76	77	23	322	330	-	5	38	5
Ind.	42	48	1	175	174	-	2	2	17
Ill.	365	369	1	718	778	-	11	7	24
Mich.	282	133	10	405	395	1	4	2	33
Wis.	24	47	-	76	77	-	1	1	33
W.N. CENTRAL	174	143	31	398	462	69	4	76	363
Minn.	17	14	5	63	91	3	2	2	112
Iowa	17	21	5	44	31	-	-	-	13
Mo.	107	68	7	202	247	40	2	45	16
N. Dak.	1	-	2	10	7	1	-	-	76
S. Dak.	-	10	3	26	23	16	-	7	101
Nebr.	26	10	3	11	18	2	-	1	14
Kans.	6	20	6	42	35	7	-	21	31
S. ATLANTIC	10,294	8,852	17	3,301	3,306	5	27	187	1,054
Del.	81	58	1	29	34	2	-	1	42
Md.	553	449	3	317	296	-	1	20	241
D.C.	487	254	-	143	114	-	1	-	6
Va.	307	216	-	300	323	2	10	14	284
W. Va.	34	6	-	58	79	-	1	2	83
N.C.	581	499	8	348	371	-	1	94	8
S.C.	526	548	2	359	346	-	-	18	80
Ga.	1,799	1,217	-	547	576	1	2	14	201
Fla.	5,926	5,405	3	1,200	1,167	-	11	4	109
E.S. CENTRAL	1,481	1,429	20	1,340	1,340	9	3	78	234
Ky.	48	13	9	365	313	5	1	28	95
Tenn.	651	572	8	374	382	3	-	34	66
Ala.	436	368	3	387	390	-	1	9	69
Miss.	344	476	-	214	255	1	1	7	4
W.S. CENTRAL	3,121	3,140	21	1,919	1,802	44	9	113	407
Ark.	183	202	1	214	212	28	-	22	66
La.	604	592	-	209	197	-	4	2	7
Okla.	111	115	8	174	172	13	-	80	27
Tex.	2,223	2,231	12	1,322	1,221	3	4	14	308
MOUNTAIN	552	527	27	405	475	11	8	11	281
Mont.	3	9	-	15	10	-	1	6	165
Idaho	2	5	4	18	26	-	-	1	10
Wyo.	1	3	-	5	2	2	-	3	33
Colo.	81	86	3	43	126	5	3	1	26
N. Mex.	39	48	1	74	73	2	1	-	10
Ariz.	123	245	10	186	200	1	3	-	32
Utah	14	21	9	18	16	1	-	-	5
Nev.	289	111	-	48	22	-	-	-	-
PACIFIC	4,721	5,769	35	2,932	3,201	5	109	5	291
Wash.	116	114	4	164	186	-	10	1	-
Oreg.	214	206	1	114	86	-	6	1	-
Calif.	4,357	5,436	30	2,612	2,743	3	90	3	281
Alaska	10	3	-	32	47	2	-	-	10
Hawaii	24	10	-	110	139	-	3	-	-
Guam	3	2	-	17	26	-	-	-	-
P.R.	468	667	-	181	215	-	4	-	50
V.I.	1	5	-	4	2	-	-	-	-
Amer. Samoa	-	-	-	3	7	-	1	-	-
C.N.M.I.	1	-	-	17	-	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending September 24, 1988 (38th Week)

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	>65	45-64	25-44	1-24	<1	Total
NEW ENGLAND	658	448	112	56	23	21	46
Boston, Mass.	183	117	32	22	6	6	22
Bridgeport, Conn.	32	21	4	4	2	1	-
Cambridge, Mass.	16	11	4	-	-	1	-
Fall River, Mass.	26	21	5	-	-	-	-
Hartford, Conn.	64	42	13	7	-	2	1
Lowell, Mass.	35	25	5	2	3	-	4
Lynn, Mass.	18	12	2	4	-	-	-
New Bedford, Mass.	19	13	3	1	1	1	-
New Haven, Conn.	66	38	14	5	4	5	4
Providence, R.I.	40	29	6	1	1	1	-
Somerville, Mass.	9	5	2	2	-	-	3
Springfield, Mass.	56	38	10	4	1	3	4
Waterbury, Conn.	31	24	2	3	2	-	1
Worcester, Mass.	63	50	8	1	3	1	7
MID. ATLANTIC	2,869	1,700	537	275	76	79	137
Albany, N.Y.	39	27	7	3	1	1	2
Allentown, Pa.	21	17	2	1	1	-	1
Buffalo, N.Y.	83	61	13	1	4	3	5
Camden, N.J.	39	21	11	5	1	1	2
Elizabeth, N.J.	29	18	6	4	-	1	4
Erie, Pa.†	36	25	6	3	2	-	2
Jersey City, N.J.	52	26	17	7	-	2	2
N.Y. City, N.Y.	1,362	832	278	181	38	33	48
Newark, N.J.	73	36	11	12	7	5	5
Paterson, N.J.	29	15	6	5	1	2	3
Philadelphia, Pa.	489	305	116	29	14	25	24
Pittsburgh, Pa.†	68	48	12	5	1	-	2
Reading, Pa.	25	20	3	1	1	-	3
Rochester, N.Y.	127	93	24	5	2	2	23
Schenectady, N.Y.	31	23	5	2	1	-	2
Scranton, Pa.†	27	22	2	2	1	-	1
Syracuse, N.Y.	67	51	9	5	-	2	4
Trenton, N.J.	25	14	5	3	1	2	-
Utica, N.Y.	19	17	2	-	-	-	1
Yonkers, N.Y.	30	27	2	1	-	-	3
E.N. CENTRAL	2,353	1,551	502	166	95	79	98
Akron, Ohio	82	68	9	2	-	3	-
Canton, Ohio	34	22	9	3	-	-	2
Chicago, Ill.§	564	362	125	45	10	22	16
Cincinnati, Ohio	153	112	29	6	3	3	13
Cleveland, Ohio	174	101	51	13	4	5	6
Columbus, Ohio	138	99	20	10	3	6	-
Dayton, Ohio	111	76	27	3	4	1	5
Detroit, Mich.	231	130	52	34	6	9	8
Evansville, Ind.	47	36	10	1	-	-	5
Fort Wayne, Ind.	61	44	9	5	1	2	5
Gary, Ind.	23	11	7	3	-	2	1
Grand Rapids, Mich.	63	45	13	1	3	1	4
Indianapolis, Ind.	153	99	41	4	4	5	2
Madison, Wis.	52	33	11	4	2	2	4
Milwaukee, Wis.	127	92	26	5	1	3	5
Peoria, Ill.	52	32	8	1	4	7	5
Rockford, Ill.	48	34	8	4	-	2	4
South Bend, Ind.	44	27	11	3	1	2	3
Toledo, Ohio	111	73	19	10	6	3	5
Youngstown, Ohio	85	55	17	9	3	1	5
W.N. CENTRAL	824	553	161	53	26	31	33
Des Moines, Iowa	65	51	7	1	5	1	5
Duluth, Minn.	27	17	8	2	-	-	1
Kansas City, Kans.	36	26	6	3	1	-	-
Kansas City, Mo.	100	67	15	9	4	5	8
Lincoln, Nebr.	35	25	4	6	-	-	3
Minneapolis, Minn.	207	132	50	14	3	8	6
Omaha, Nebr.	73	53	14	2	2	2	7
St. Louis, Mo.	145	88	30	6	8	13	-
St. Paul, Minn.	65	40	13	9	2	1	-
Wichita, Kans.§	71	54	14	1	1	1	3
S. ATLANTIC	1,107	659	256	115	31	44	50
Atlanta, Ga.	153	79	42	23	8	1	6
Baltimore, Md.	220	126	60	20	4	8	7
Charlotte, N.C.	68	42	17	5	1	3	3
Jacksonville, Fla.	92	58	18	11	5	-	4
Miami, Fla.	88	55	15	9	3	6	2
Norfolk, Va.	68	39	14	6	-	9	2
Richmond, Va.	78	53	15	8	-	2	8
Savannah, Ga.	36	22	12	2	-	-	5
St. Petersburg, Fla.	60	48	5	4	2	1	3
Tampa, Fla.	68	46	14	3	1	2	5
Washington, D.C.	154	75	38	22	7	12	3
Wilmington, Del.	22	14	6	2	-	-	2
E.S. CENTRAL	662	423	152	52	17	18	36
Birmingham, Ala.	98	55	23	11	3	6	3
Chattanooga, Tenn.	73	54	14	3	1	1	3
Knoxville, Tenn.	87	63	12	6	5	1	7
Louisville, Ky.	27	18	8	1	-	-	1
Memphis, Tenn.	150	100	32	15	2	1	15
Mobile, Ala.	78	45	20	5	3	5	2
Montgomery, Ala.	46	28	10	6	1	1	3
Nashville, Tenn.	103	60	33	5	2	3	2
W.S. CENTRAL	1,736	1,079	384	188	47	40	53
Austin, Tex.	52	34	15	2	-	1	2
Baton Rouge, La.	50	41	7	1	-	1	-
Corpus Christi, Tex.§	48	37	10	1	-	-	1
Dallas, Tex.	192	110	39	32	6	5	2
El Paso, Tex.	42	22	12	6	1	1	2
Fort Worth, Tex	94	65	14	10	3	2	4
Houston, Tex.§	747	441	173	92	25	16	19
Little Rock, Ark.	61	37	15	5	1	3	3
New Orleans, La.	102	59	26	11	4	2	-
San Antonio, Tex.	188	130	36	13	4	5	10
Shreveport, La.	75	49	15	8	1	2	5
Tulsa, Okla.	87	54	22	7	2	2	5
MOUNTAIN	681	444	118	60	32	27	29
Albuquerque, N. Mex.	103	70	15	9	6	3	4
Colo. Springs, Colo.	30	15	4	3	3	5	4
Denver, Colo.	105	60	17	14	8	6	2
Las Vegas, Nev.	107	69	28	8	2	-	8
Ogden, Utah	29	22	5	2	-	-	4
Phoenix, Ariz.	141	85	28	11	7	10	2
Pueblo, Colo.	23	19	3	1	-	-	-
Salt Lake City, Utah	39	27	3	6	1	2	-
Tucson, Ariz.	104	77	15	6	5	1	5
PACIFIC	2,101	1,402	362	204	66	57	111
Berkeley, Calif.	16	12	2	2	-	-	1
Fresno, Calif.	72	46	21	2	-	3	5
Glendale, Calif.	37	29	3	4	1	-	1
Honolulu, Hawaii	71	58	7	4	1	1	8
Long Beach, Calif.	126	81	24	11	1	9	16
Los Angeles Calif.	645	420	107	73	30	9	16
Oakland, Calif.	86	49	15	10	5	7	2
Pasadena, Calif.§	37	27	7	3	-	-	1
Portland, Oreg.	123	87	13	15	7	1	6
Sacramento, Calif.	136	95	26	11	2	2	21
San Diego, Calif.	151	93	32	14	6	3	10
San Francisco, Calif.	190	123	31	24	3	8	6
San Jose, Calif.	168	109	34	13	7	5	10
Seattle, Wash.	149	108	21	11	1	8	4
Spokane, Wash.	49	34	10	4	1	-	2
Tacoma, Wash.	45	31	9	3	1	1	2
TOTAL	12,793††	8,257	2,584	1,169	373	396	593

*Mortality data in this table are voluntarily reported from 121 cities in the United states, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

**Pneumonia and influenza.

†Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

††Total includes unknown ages.

§Data not available. Figures are estimates based on average of past available 4 weeks.

Increase in Pneumonia Mortality Among Young Adults and the HIV Epidemic — New York City, United States

Most pneumonia-attributable deaths occur among the elderly. In New York City (NYC), however, the number and rate of such deaths among younger persons have increased in association with human immunodeficiency virus (HIV) infections in intravenous-drug abusers (IVDAs) (*1,2*). In addition, data from CDC's 121 Cities Mortality Surveillance System (CMSS) suggest that similar trends may be occurring in other cities.

New York City. In NYC, concurrent with the high incidence of acquired immunodeficiency syndrome (AIDS), mortality rates for pneumonia or bronchopneumonia not otherwise specified (*International Classification of Diseases, Ninth Revision*, codes 485.0–486.0) in persons 25–44 years of age increased from 4.2 deaths/100,000 population in 1978 to 19.1 in 1987 for males and from 2.4 to 6.5 for females. Investigations of 192 (83%) of 230 clinical records of persons 25–44 years of age who were hospitalized in 1986 and died from pneumonia revealed the following: 153 (80%) were in groups at increased risk for AIDS, 126 (82%) of whom were IVDAs; 50 (26%) had evidence of oral thrush on hospital admission, and 26 (14%) had a condition diagnosed that would fulfill the criteria of the revised surveillance case definition for AIDS (*3*).

121 Cities. To determine whether similar changes in pneumonia-attributable deaths may be occurring in other cities, trends in pneumonia and influenza (P&I) deaths were examined using a mortality surveillance system that provides more recent city-level data than are available from national vital records.

Each week, 121 cities, constituting one fourth of the U.S. population, report to CDC the total number of registered deaths and the number of P&I-attributable deaths by age ("pneumonia" being the immediate or underlying cause, "influenza" appearing anywhere on the death certificate) (*4*). The cities were ranked by cumulative AIDS incidence (total cases reported to CDC since 1981 per 100,000 population) into deciles from highest to lowest incidence, and trends in the age distribution of persons who died from P&I were examined for 1962 through 1987.

Following a gradual decline over the preceding 2 decades, the percentage of all P&I-attributable deaths and the absolute number of P&I-attributable deaths in persons 25–44 years of age (the group most affected by AIDS) increased markedly beginning in 1981 in cities in the highest decile of AIDS incidence, with smaller increases in this percentage for cities in the next highest decile and in all other cities (Figure 1). For example, in the highest decile cities in 1979–80, 4.1% (408/10,006) of P&I deaths were in persons 25–44 years of age, compared with 10.0% (1,127/11,280) in 1986–87. This is a 176% increase in the number of P&I-attributable deaths and an increase in P&I mortality rates from 5.2 to 13.7 deaths/100,000 population for the 25–44-year age group.*

Cities in the highest decile included NYC, and the percentages of P&I-attributable deaths in persons 25–44 years of age were 3.6% in 1979–80 and 10.6% in 1986–87 for NYC and 4.7% and 9.2%, respectively, for the others. For cities in the second highest decile, the percentages of P&I-attributable deaths in the 25–44-year age group were

*Mortality rates were estimated using decennial U.S. census data for the 121 cities, with populations for intercensus years estimated by linear interpolation or extrapolation. As a result, actual mortality rates for the 121 cities may be slightly higher or lower than presented here.

Pneumonia — Continued

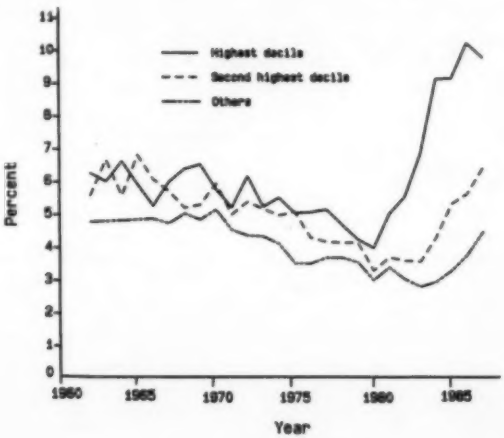
3.7% in 1979–80 and 6.0% in 1986–87, and P&I mortality rates were 3.7 and 9.2 deaths/100,000 population, respectively. For cities in the remaining deciles, these percentages were 3.2% and 4.1%, and P&I mortality rates were 5.7 and 9.1 deaths/100,000 population for 1979–80 and 1986–87, respectively. Among the latter, for the cities in the lowest decile of AIDS incidence, the percentage of P&I-attributable deaths in the 25–44-year age group declined slightly from 2.9% to 2.3%, while P&I mortality rates remained relatively stable at 3.5 and 3.7 deaths/100,000 population in 1979–80 and 1986–87, respectively.

In the cities in the highest decile of AIDS incidence, trends in the age distribution of P&I-attributable deaths varied according to the percentage of AIDS cases in IVDAs. In seven of these cities, more than one third of AIDS cases (range 35%–72%) were in IVDAs (heterosexual or homosexual/bisexual). In these seven cities, the percentage of P&I-attributable deaths in persons 25–44 years of age increased from 4.1% (274/6,704) in 1979–80 to 12.1% (922/7,646) in 1986–87, and P&I mortality rates increased from 6.0 to 19.8 deaths/100,000. In contrast, for the other five cities in the highest AIDS decile, 9%–18% of cases were in IVDAs. In these five cities, the respective increase in the percentage of P&I deaths in the 25–44-year age group was less, from 4.1% (134/3,302) to 5.6% (205/3,634), with a smaller increase in P&I mortality rates as well, from 4.2 to 5.8 deaths/100,000 population.

The seasonal distribution of deaths in the 25–44-year age group was similar to that for other age groups for cities in the highest AIDS decile, with peaks occurring during the winter in both groups for 1984–1987 combined (Figure 2).

The increases in P&I-attributable deaths could be due in part to *Pneumocystis carinii* pneumonia, a leading cause of death in AIDS patients. However, seven of the 12 cities in the highest AIDS decile reported excluding such deaths from P&I counts. In these seven cities, an increase in the number and percentage of P&I-attributable

FIGURE 1. Percentage of pneumonia- and influenza-attributable deaths in persons aged 25–44 years, ranked by decile of AIDS incidence, by years — 121 cities, United States, 1962–1987



Pneumonia — Continued

deaths in the 25–44-year age group was still observed, with 4.1% (373/9,091) of P&I deaths occurring in this age group in 1979–80, increasing to 9.3% (945/10,134) in 1986–87.

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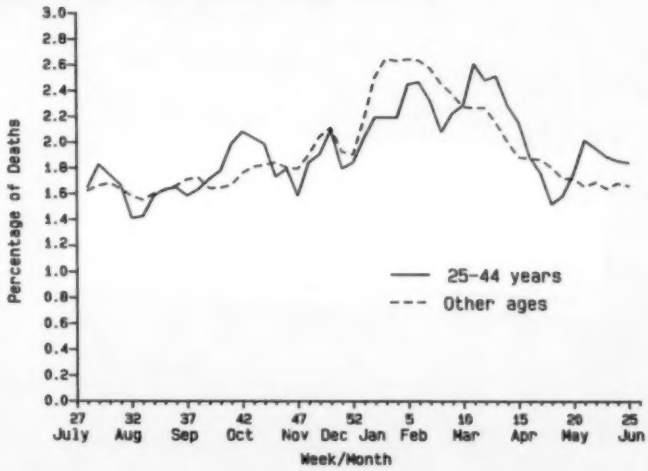
Editorial Note: In the past decade, an increase in pneumonia mortality rates has occurred in young adults in NYC. Many of these pneumonia deaths have occurred in IVDAs, a group at increased risk for HIV infection. Other investigations from NYC based on hospital data, medical examiner specimens, and cohorts of IVDAs have identified bacterial pneumonia as an important cause of death among HIV-infected IVDAs (*1,2,5*).

Data from the CMSS indicate that, during the 1980s, both the number and percentage of P&I-attributable deaths in persons 25–44 years of age, as well as the P&I mortality rate, have more than doubled in cities with a high incidence of AIDS. Lesser increases were observed in other cities, except those with the lowest AIDS incidence, where the P&I mortality rate in this age group was relatively stable. Among the cities with high AIDS incidence, shifts in the age distribution of P&I deaths and mortality rates in the 25–44-year age group have been greatest in cities with a comparatively high proportion of IVDAs among persons reported to have AIDS. P&I deaths in the 25–44-year age group occur seasonally, as do those in other age groups. Seasonal peaks in P&I-attributable deaths have been associated with influenza infections (*4*); however, the contribution of influenza to HIV-related mortality, if any, has not been determined. These data suggest that, in areas with a high incidence of

FIGURE 2. Seasonal distribution of pneumonia- and influenza-attributable deaths in cities ranked by decile of AIDS incidence, by age group, and 3-week moving average — 121 cities, United States, 1984–1987 combined



Pneumonia — Continued

AIDS, further investigations of P&I-attributable deaths should focus on the role of underlying HIV infection.

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